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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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COUNTRY USSR

SUBJECT Micrometeorology and Scientists Working on Atmospheric Turbulence

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1. Micrometeorology is concerned with the variations in wind velocity, temperature, etc, in the lowest layer of air for two quite different reasons.

2. First, since these variations are so large (i.e. the temperature of a dry soil surface may differ by 40° or 50° F from the temperature five feet above it), they are in themselves quite important, especially to agriculture.

3. Second, the spread of heat, water vapor, smoke or atmospheric contamiuants depends upon these same variations in wind velocity and temperature.

4. It is only the work done in this second category which is applicable to CW, and fortunately the two can easily be separated, since the measurements required must be far more accurate in the second case. For example, the measurements made by Rumdas, of India, are quite satisfactory for agriculture, (his interest), but practically valueless to CW.

5. In the USSR, such agriculturally directed work is quite naturally a rather important part of the total work in Meteorology, as can be seen from the fact that about 75% of the scientific articles on meteorology from the USSR have a micrometeorological slant, as compared with less than 25% for the rest of the world. The USSR probably leads the rest of the world in this field, according to several scientists of Western Europe. Such agricultural work in the USSR and its subjugated "vassals" is

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typified by such papers as:

(a) Aleksander Kosiba's article, published in 1951, on "Vertical Climatic Differences in the Lowest Strata of the Atmosphere" based on micrometeorological measurements at the Institute of Meteorology and Climatology of the University of Warsaw;

(b) Ia. I. Feldman's article "On the Influence of Forests on the Formation of Local Weather in the Taiga of European USSR, and;

(c) A. M. Shulgin's article "On the Problem of the Amelioration of Soil Climate in Altai".

6. On the other hand, the work applicable to CW requires much more expensive instrumentation, and must be carried on by scientists well trained in fluid mechanics or aerodynamics as well as meteorology. The fact that the only known "Laboratory of Atmospheric Turbulence" in the world is part of the Geophysics Institute of the Soviet Academy of Sciences would indicate that not only do the Soviets consider this an important matter, but that they may be considerably ahead of the Western world in such matters.

7. Indeed, the appearance of E M Dobryshman's "On Transformation Processes over Microrelief" (Glavnoe Uravlene's Gidrometeorologicheskoi Sluzby, Informatsionnyi Sbornik 1:42-46, 1951) indicates that scientists of the USSR are already trying to describe the combination of the effects of variations of turbulent exchange in the vertical and variations in the horizontal on a sound theoretical basis, a logical and needed step which we in the US are scarcely ready for.

8. Scientists working on atmospheric turbulence can be divided into two groups, those whose work is related directly to the transport of any atmospheric property (contaminants included, although not described in the literature) and those whose background is near enough to allow them to work in this field, but not apparently so oriented at present.

9. An incomplete list of the first group should include:

A M Obukov	-	Perhaps the most important at the Soviet Laboratory of Atmospheric Turbulence (See Microstructure of Turbulent Flow, Priklanaya Matematika i Mekhanicka, Vol. 15, 1951, and numerous papers for last 10 years).
D L Laikhtman	-	A very good man, wrote "Physics of the Layer of Air Near the Ground", in 1949, a book US scientists should translate.
S A Sapozhnikova	-	Another very good man. He wrote "Microclimate and Local Climate", in 1950.
M I Iudin	-	Author of "Questions of Turbulence Theory and Structure of Wind with Application to the Problem of Airplane Vibrations"
S L Bastamov	-	Author of "Artificial Climate Laboratories" 1950 -- Specific investigations on snow drifting and temperatures and evaporation from the soil are outlined.
V A Obruchev	-	Author of "Role and Significance of Dust in Nature", 1951
N I Egorov	-	Author of "Calculation of the Heat Balance of the Red Sea" - 1950.

K I Kuchin
K H P Pogosian - Co-authors of "On Moisture exchange in the Atmosphere", 1950

A.A Skvartsov - Author of "Heat Convection and Exchange in the Surface Layer of the Atmosphere", 1951

V V Shulteikin - Not too good, but head of the Hydrometeorological Service of USSR, so now probably concerned only with administration.

Chudnovskii - Worked with Lettman

Yaglom - Good man on theory, works with Obukhoff

10. Among those indirectly concerned would be:

Budyko - Most important man in field of evaporation by turbulent transport. A very good man.

P I Kolcskov - Authority on Micrometeorology of Eastern USSR

Iaroslavtsev)
Kuznetsov) - Good men on whom I have little or no information.
Tverskoi)
Timofeev)

11. To the above list should be added the name of Kollmagoroff who is the outstanding Soviet authority on aerodynamics and is undoubtedly [redacted] working with the Soviet Laboratory of Atmospheric Turbulence. 25X1

25X1 12. [redacted] the Soviet scientist has worked out a unique method of circumventing the strict limitations placed upon his private research endeavors. He will work out a research problem theoretically and then present his theories to his superiors, withholding the fact that he has already solved the problem. A request to work out the problem in the laboratory will be made and if permission is granted, he will not utilize all of the time allotted to him for the problem as he already knows the answers and knows he can actually complete the work in a very short time. With the extra, or free time, he will then devote to a private research problem of his own.

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